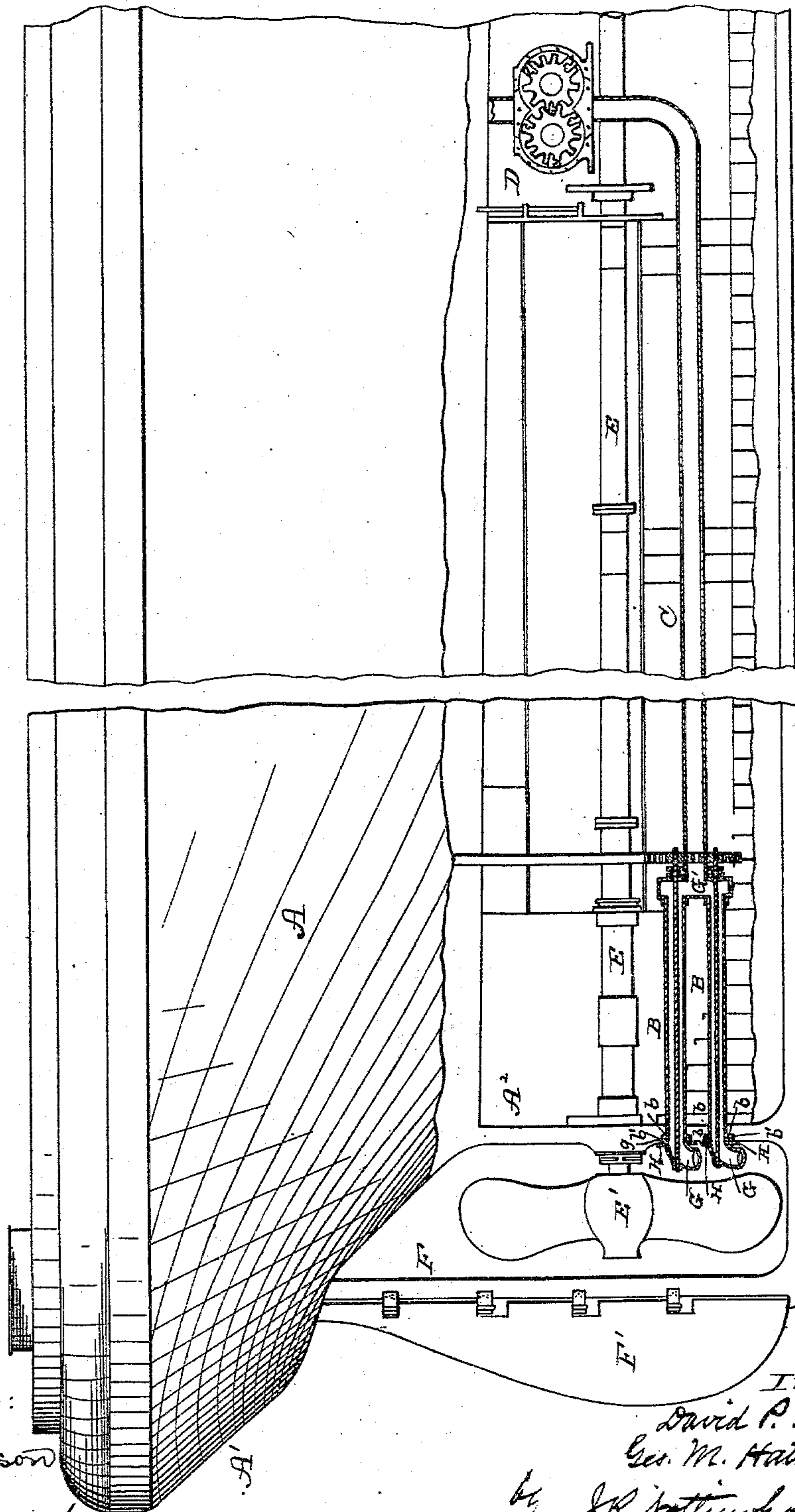


(No Model.)

3 Sheets—Sheet 1.

D. P. DEY & G. M. HATHAWAY.  
HYDRAULIC STEERING ENGINE FOR SHIPS.  
No. 286,534. Patented Oct. 9, 1883.

Fig. 1.



Witnesses:

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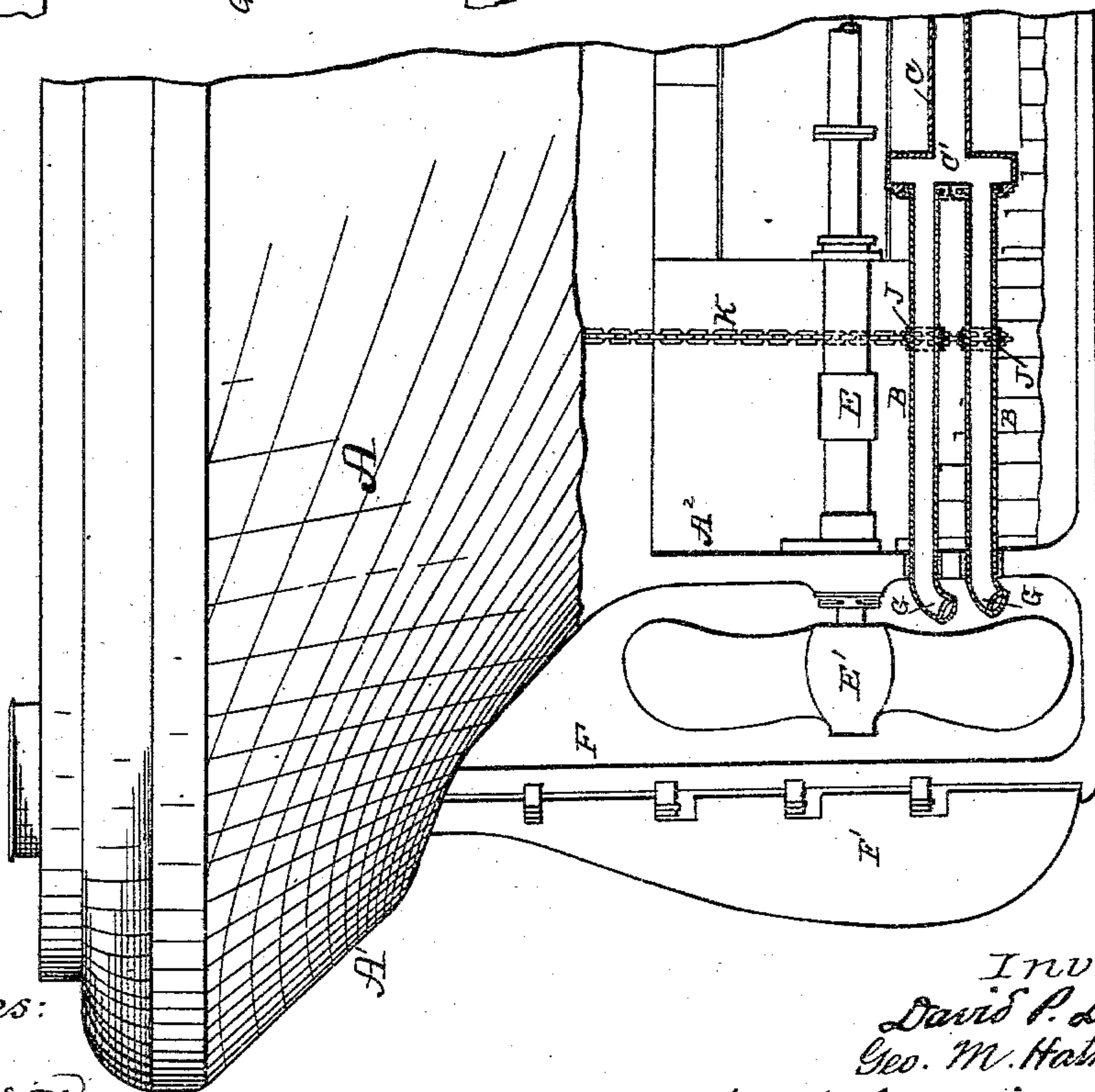
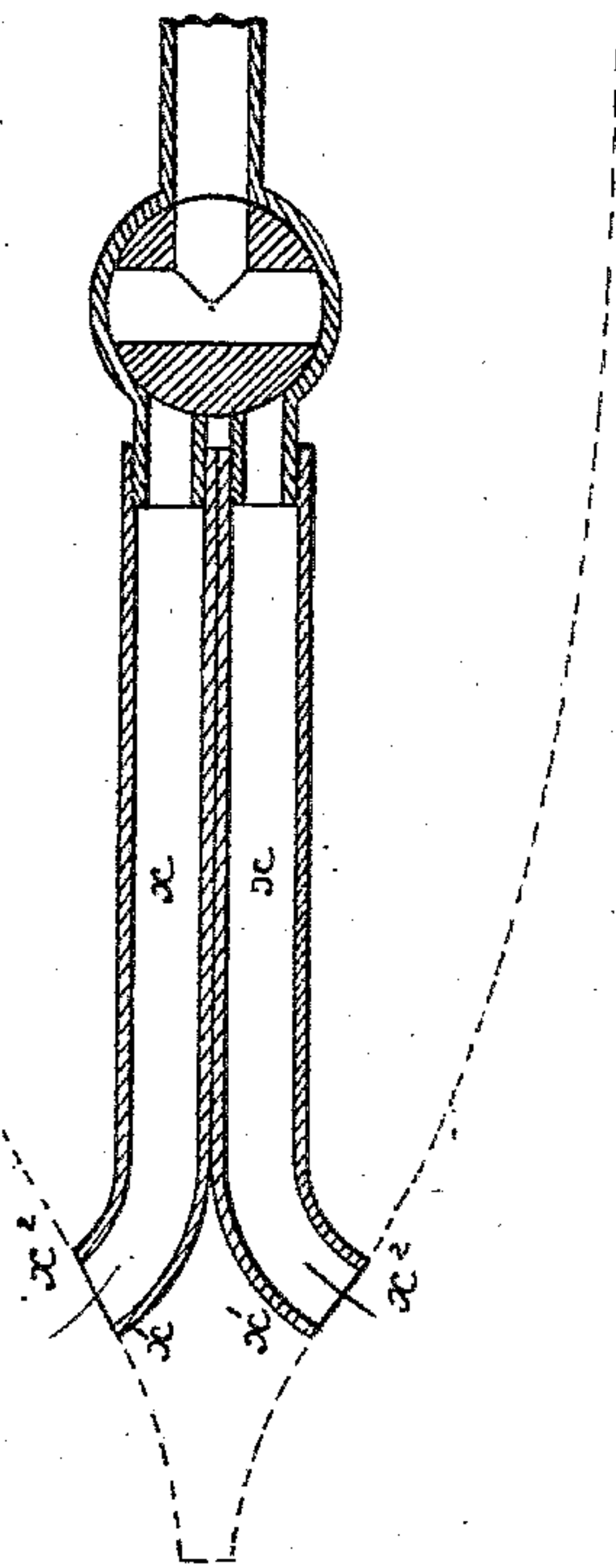
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3 Sheets—Sheet 2.

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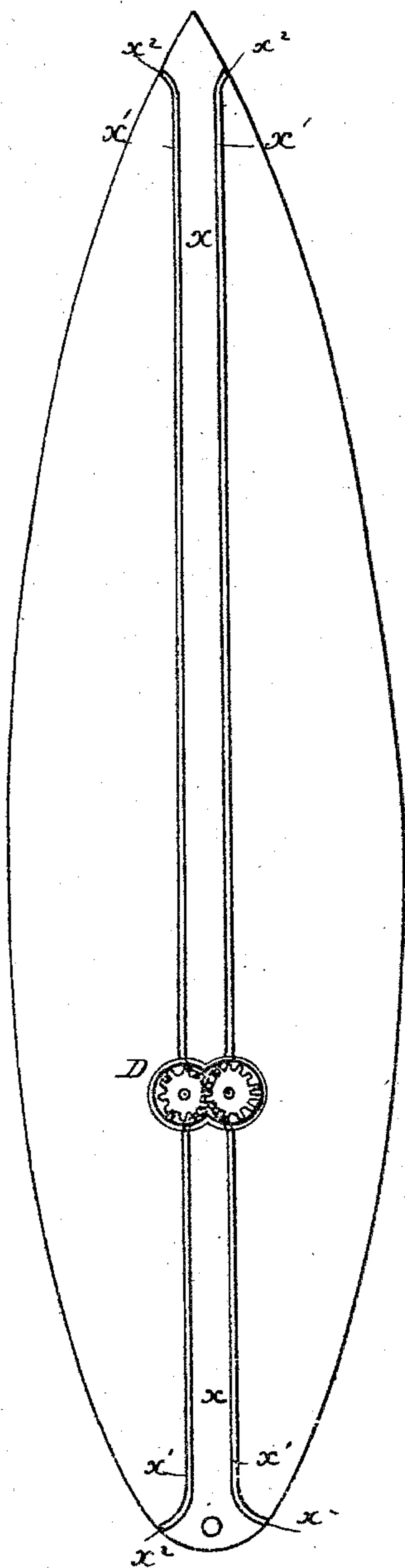


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HYDRAULIC STEERING ENGINE FOR SHIPS.  
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Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## HYDRAULIC STEERING-ENGINE FOR SHIPS.

SPECIFICATION forming part of Letters Patent No. 286,534, dated October 9, 1883.

Application filed February 12, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, DAVID P. DEY and GEORGE M. HATHAWAY, citizens of the United States, residing, respectively, at Brooklyn, county of Kings, and New York, county of New York, and State of New York, have invented certain new and useful Improvements in Apparatus for Steering Vessels, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to a means for steering a vessel in case the rudder has been carried away or is inoperative, and for turning boats under other conditions, the novelty consisting in the construction and arrangement of the parts, as will be more fully hereinafter set forth, and specifically pointed out in the claims.

As heretofore practiced the loss of a rudder was a calamity, and great trouble has been experienced in supplying a substitute. This invention is designed to supply means for steering the ship, said means being always in readiness and capable of being instantly brought into service.

It will be seen that the device is equally efficient in other service—that is to say, where the rudder has no effect upon its action—as, for instance, in turning boats in close quarters, either from the stern or from the bow, or both, and out of all possibility of being disabled by armament in action.

The invention is fully illustrated in the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents the stern of a vessel, partly in elevation and partly in section, showing our improved device as applied thereto; Fig. 2, a similar view, showing a modification of the device; Fig. 3, an enlarged view of the device, and Figs. 4 and 5 modifications of the same.

Referring to the drawings, A represents the body of the vessel, having stern A' and stern-post A<sup>2</sup>. Suitably journaled in the stern-post are pipes B, having flanges b, which are received into a rabbet, b', in said stern-post. These pipes are provided at the other end with a thread, which is secured into a re-en-

forced opening in the vertical portion C' of the pipe C, which leads from the pump D and has a closed lower end. The pipes B B are arranged below the main shaft E, carrying propeller E', said propeller being arranged between the stern-post A<sup>2</sup> and the rudder-post F, upon which is properly hinged the rudder F'.

G represents an oscillating tubular elbow, having flange g, which abuts squarely against the flange b of the pipe B, and is received into the rabbet b', being secured in place by the annular plate H, which is firmly bolted in place, leaving room for the free oscillation of the tubular elbows. To these elbows are secured, rigidly, rods I, which, extending through proper packing formed upon the pipe C', are provided with toothed pinions J, arranged one directly above the other.

K K represent two rack-bars, which embrace the pinions J in such a manner as to render the meshing between the pinions and bars effectual. The bars K extend upward, and are either operated by the wheel or by other means convenient to the steersman in such manner that the elevation of one bar and the depression of the other operates to turn the elbows G G, with their exits, squarely to one side of the vessel, while a similar motion in the opposite direction serves to turn the said exits to the other side of the boat.

Instead of the rack-bars and pinions, it is obvious that chain and sprocket would serve with equal efficiency. Such a construction is illustrated in Fig. 2, in which the sprocket-wheels are shown mounted on the pipes.

It will be understood that as water or steam is forced through the pipe C C' and pipes B B the steersman, through the devices mentioned, K J I, directs the water or steam to either side of the boat at will. As shown on Fig. 2, the pipes and tubular elbows are made in one piece and the rods I I dispensed with. In this construction one end of each of the pipes is flanged and works in confining-sockets suitably packed, while the portion of each near the elbow is journaled in sleeves set in the stern-post, said sleeves being also provided with packing. The pinions or sprocket wheels being mounted on the pipes, said pipes are



caused, by means of the rack-bar or chain operated by the steersman, to turn the elbows with their exits, as above described.

In Fig. 4 is shown a pump arranged amidships, or nearly so, and two sets of pipes extending longitudinally and centrally for the greater portion of their distances, but being deflected at their ends outwardly. By means of the pump the water may be directed in such manner that it is forced into one of the pipes, passed through said pipe, and ejected from one side of the vessel, near the stern, and at the same time it is forced through the opposite pipe and ejected from the opposite side of the vessel, near the bow, thus exerting a double force to turn the vessel.

In a modification shown in Fig. 5 two parallel pipes,  $x x$ , have their ends  $x' x'$  bent in opposite directions, so that their exits  $x^2 x^2$  are upon opposite sides of the boat, near the stern. At any proper point is placed a two-way cock, which may be manipulated so as to cut off the flow from either pipe and deflect it through the other. It will of course be understood that the pump is used in connection with this modification.

It will be understood that in the main invention the exits for water or steam may be placed upon either bow or stern, or both; but in the latter construction it is especially adapted for efficient service in close quarters—such as harbors, &c.—and this construction may be applied to small craft, such as tugs, canal-boats, &c.

Modifications in details of construction may be employed without departing from the principle or sacrificing the advantages of our invention, the essential features of which will be understood from the foregoing description, taken in connection with the drawings.

Having thus described our invention, what we claim is—

1. In a device for steering vessels, in combination with the pipes having elbows at their rear ends and journaled in the stern-post of the vessel, so as to rotate freely, the cog-pinions connected with said pipes, and the rack-bars, whereby said pipes and elbows may be rotated to direct a current of water, air, or steam from a suitable source to either side of the vessel, substantially as described.

2. In combination with the elbows G G, journaled in the stern-post of the vessel, the rods I I, connected to said elbows, and provided with pinions J J, and the rack-bars K K, adapted to operate said elbows to direct a current of water, steam, or air from a suitable source to either side of the vessel, substantially as described.

3. In combination with the pump D, main pipe C C', pipes B B, and elbows G G, journaled in the stern-post, the rods I I, carrying pinions J, and the rack-bars K, and means for operating said pinions and bars simultaneously in either direction, as set forth.

4. The combination, with the elbows G G, provided with flanges  $g g$ , and journaled in the stern-post of the vessel, of the re-enforced plates H H, secured to the stern-post, and through which the horizontal portion of the elbows extends, substantially as described.

5. The combination, with the elbows G G, flanged as described, and journaled in the stern-post of the vessel, of the pipes B B, flanged at their rear ends, which set against the flanges of the elbows, the pipe C', connecting with the said pipes B B, and the stuffing or packing boxes opposite the forward ends of the pipes B, through which pass the rods I, whereby the elbows may be turned, substantially as described.

6. The combination, in a device for steering vessels, of the flanged elbows G G, journaled in the stern-post of a vessel, the re-enforced plates H H, secured to said stern-post, the pipes B B, flanged at their rear ends, which set against the flanges of the elbows, the connecting-pipe C', and the rods I I, secured at one end to the elbows, the packing-boxes through which said rods operate, the pinions on the ends of said rods, and the rack-bars and mechanism for operating the same, and the elbows, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

DAVID P. DEY.  
GEORGE M. HATHAWAY.

Witnesses:

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